



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,581	09/30/2003	Ji-Soo Kim	SEC.745C	1609

7590 10/19/2004
VOLENTINE FRANCOS, PLLC
SUITE 150
12200 SUNRISE VALLEY DRIVE
RESTON, VA 20191

EXAMINER

FERNANDEZ, KALIMAH

ART UNIT	PAPER NUMBER
----------	--------------

2881

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,581

Applicant(s)

KIM ET AL.

Examiner

Kalimah Fernandez

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-14 and 21-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No 5,594,245 issued to Todokoro et al.
3. Todokoro et al disclose a method of determining whether a conductive wafer is exposed through a contact hole that is formed in an overlying layer by a plasma process (see for example col.2, line 41- col.3, line 18; col.3, line 65-col. 4, line 5). Specifically, Todokoro et al disclose the capability to observe both surface and internal structure with or without the presence of contact holes (see also col. 12, lines 20-58).
4. Todokoro et al disclose repeatedly scanning an inside of a contact hole with a beam of primary electrons (see for example col.14, lines 22-45; col.16, lines 48-53).

5. Todokoro et al disclose collecting secondary electrons that are generated by a reaction between the primary electron beam and an inside surface of the contact hole and that are emitted from the contact hole (col.12, line 59- col.13, line 30).

6. Todokoro et al implicitly disclose determining whether a surface of the conductive layer is exposed through the contact hole in the insulating layer pattern based on a change in an amount of collected secondary electrons (col.12, lines 20-46). Todokoro et al disclose the ability to determine the composition of both the surface and bottom of a contact hole by the change of the collected secondary electron. Therefore, Todokoro et al discloses the ability to determine whether a conductive layer is exposed as claimed.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10-14 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 5,594,245 issued to Todokoro et al and US Pat No US 6,066,849 issued to Masnaghetti et al.
3. Todokoro et al teach the claimed invention except for counting number of scans for data processing purpose.
4. However, Masnaghetti et al teaches repeatedly scanning an inside of the contact hole with a beam of primary electrons (col.9, lines 41-57; see figs.6c-d).
5. It would have been obvious to an ordinary artisan at the time of the invention to combine Todokoro et al and Masnaghetti et al because Masnaghetti et al teach improve image resolution (see for example col.1, line 66- col. 2, line 15).
6. An ordinary artisan would have found obvious motivation to combine the teachings flowing from Masnaghetti's ability to maintain a specific charge level on an area, including multiplexing a contact hole (col.8, lines 63-68; col.9, lines 41-68).
7. As per claim 10, Todokoro et al teach a gate electrode, wherein the disclosure of undersurface wiring pattern embodies a gate electrode (col.20, lines 9-28).

8. As per claims 11 and 21, Masnaghetti et al teach repeatedly scans the predetermined region of the surface of the wafer with the primary electron beam (col.5, lines 55-68). Masnaghetti et al teach the pulsing of the electron beam (see figs. 3a-d; col.6, lines 48-68). Masnaghetti et al teach counting the number of scans (col.7, lines 15-20).

9. As per claims 12-13 and 22-23, Masnaghetti et al teach providing a sample graph showing the change of collected secondary electrons as a function of the number of scans (wherein scan voltage are indicative of the number of scans). (See figs. 4a-b and fig.5; col.7, lines 54-67). Therefore, it would have been obvious to an ordinary skilled artisan to illustrate a graph as recited, if so desired. Masnaghetti et al teaches comparing the scanning conditions, but fails to teach a reference graph. However, the graphing technique as taught by Masnaghetti et al would obviously motivate an artisan to illustrate said comparison as recited because the use of a reference graph would obviously minimized operator error.

10. As per claim 14, the recitation of a "the number of scans of the primary electron beam is no more than 200" is a matter of obvious design choice since the general skill of a worker in the art enables one to determine how many scans are sufficient for analysis.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 571-272-2470. The examiner can normally be reached on Mon-Tues 6:30-3:30; Wed-Thurs 8-5 and Fri.9am-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kf



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800